

Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 8.

July, 1906.

No. 91

THE VIOLETS AND VIOLET HYBRIDS OF THE DISTRICT OF COLUMBIA AND VICINITY.

(Plates 71, 72.)

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DURING the seasons of 1904 and 1905, a survey of the violets of this region was undertaken by the writer with the object in view of ascertaining the status of certain peculiar forms, some already described as species and others recognized as hybrids, and further to discover if possible whether or not the supposed hybrids were consistent with the pure species found in their immediate neighborhood.

A careful field study was made of a large number of colonies, and sets representing my collections have been placed in the herbaria of the National Museum, New York Botanical Garden, Missouri Botanical Garden, Harvard University, Ezra Brainerd and H. D. House.

Practically all of the characteristics peculiar to violet hybrids as noted by Mr. Brainerd in recent articles, apply to those found in this vicinity. Moreover, not a single hybrid was found but that the parent species were immediately associated with it or were to be found within a few rods. A brief review of the methods of cross-fertilization of the violets shows that for two species to be crossed they must not only occur in the same region but must be cohabitant with each other or at most, occur within a few rods of each other. Another noticeable fact is that the most remarkable hybrids and variations always occur upon new soil, recently cleared land, embankments, along ditches, etc. — in short, in places the conditions of which are due to the work of man and not nature.

It is not necessary for the purposes of this article to redescribe species already well characterized in recent manuals, and the pure species may be named as follows:

1. *V. ODORATA* L., escaped from cultivation.
2. *V. BLANDA* Willd. (*V. LeConteana* G. Don). According to Mr. Brainerd (*RHODORA* 7: 248. 1905), the species heretofore called *V. LeConteana*, must now be referred to Willdenow's *V. blanda*.
3. *V. LANCEOLATA* L.
4. *V. PRIMULIFOLIA* L.
5. *V. PEDATA* L.
6. *V. PEDATA INORNATA* Greene (*V. inornata* Greene, *V. pedata lineariloba* DC.?).
7. *V. PALMATA* L.
8. *V. VESPERTILIONIS* Greene.
9. *V. ORNITHODES* Greene. Occurs sparingly at Cleveland Park and along the Potomac River above The District line.
10. *V. STONEANA* House. First described and figured by Witmer Stone as *V. septemloba*, from plants collected in Southeastern Pennsylvania. Found in abundance by the writer at Hyattsville and Patuxent and at Rockville by Mr. Jos. H. Painter.
11. *V. PAPILIONACEA* Pursh.
12. *V. FILICETORUM* Greene.
13. *V. SORORIA* Willd. Occurs abundantly in rocky places along the Potomac River above Washington and sparingly in other localities.
14. *V. AFFINIS* LeConte. (*V. obliqua* Hill?)
15. *V. VILLOSA* Walt.
16. *V. CUCULLATA* Ait. (Including *V. macrotis* Greene, and other segregates.)
17. *V. BRITTONIANA* Pollard. Related to *V. septemloba* LeConte, of the southern states and certainly distinct from it according to the unpublished plate of LeConte's and recent collections made in the south which agree with the original plate in having conspicuous runcinate lobes, an important character not found in *V. Brittoniana*.
18. *V. PECTINATA* Bicknell. Doubtfully distinct from *V. Brittoniana*, and apparently an entire-leafed form of it. One clump only was noted along with *V. Brittoniana* at Riverdale.
19. *V. FIMBRIATULA* J. E. Sm.
20. *V. SAGITTATA* Ait.
21. *V. EMARGINATA* (Nutt.) LeConte.

22. *V. SCABRIUSCULA* Schwein. Along the River bottoms of the Potomac River above Washington.

23. *V. PUBESCENS* Ait. Great Falls, Md., Fairfax Co. and Blue-mont, Va.

24. *V. CONSPERSA* Reichenb. (*V. Muhlenbergii* Torr., *V. laborica* Authors, probably not of Schrank.) Rock Creek Park and toward Great Falls.

25. *V. STRIATA* Ait. Common along the River bottoms and Canal banks above the city of Washington.

26. *V. RAFINESQUII* Greene.

In addition to this list, the following forms have been described from this region, the exact status of which I have not had the opportunity to determine: *V. laetecaerulea* Greene, *V. filicetorum* var. *parthenica* Greene, *V. emarginata* var. *simulata* Greene, and *V. fontana* Greene.

The recognized hybrid forms are best given in alphabetical order as follows. All specimens cited by number or date unless otherwise stated were collected by the writer.

Viola affinis × **papilionacea** *hyb. nov.* At Woodridge, D. C., on a moist wooded hillside is a large colony of *V. affinis* (No. 651), and at the base of the hill in a meadow, *V. papilionacea* is abundant. When first seen (May 3d) there was noticed an abundance of what seemed to be a darker and broader-leaved form of *V. affinis*, growing lower down on the hillside than *V. affinis*. The intermediate characters of the leaves and flowers indicated its hybrid origin which specimens in fruit gathered later (June 15th) showed to be true. The abortive capsules were distinctly pubescent and the plant much larger than typical *V. affinis*.—Woodridge, D. C., May 3d, 1905 (No. 652) and June 15, 1905. Type in herb. H. D. House.

VIOLA AFFINIS × **SAGITTATA** Brainerd, *RHODORA* 8: 55. 1906.—Patuxent, Md. June 4, 1905 (No. 972, type).

VIOLA AFFINIS × **VILLOSA** Brainerd, *RHODORA* 8: 56. 1906.—Rock Creek Park, May 13, 1905 (Nos. 702, 705, 710); Glen Echo, May 17, 1905 (No. 733); Kensington, June 11, 1905 (No. 1003); Glen Carlyn, Va., June 25, 1905 (No. 1053, in part).

VIOLA BRITTONIANA × **CUCULLATA** House, *Bull. Torrey Club* 32: 255, pl. 17. 1905. *V. notabilis* Bicknell, *Torreyana* 4: 131. *V. cucullata* × *septemloba* Brainerd, l. c. 52.—Riverdale, Md., June 8, 1905 (No. 988, in part).

Viola Brittoniana × **emarginata** nom. nov. *V. emarginata* × *septemloba* Brainerd, RHODORA 8: 53. 1906.— One of the oddest of violet hybrids, growing in dense matted clumps and showing a great diversity in leaf outline. (PLATE 71.) Hyattsville, May 7, 1905 (No. 683), June 4, and Sept. 25, 1905 (No. 937).

Viola Brittoniana × **sagittata** nom. nov. *V. sagittata* × *septemloba* Brainerd, l. c. 51, pl. 66, a & b.— Riverdale, May 1, 1905 (No. 639, type), and June 8, 1905 (No. 989).

VIOLA CUCULLATA × EMARGINATA Brainerd, RHODORA 8: 53. 1906. Hyattsville, Sept. 25, 1905 (No. 1637).

VIOLA EMARGINATA × FIMBRIATULA Brainerd, RHODORA 8: 57. 1906. Woodridge (Near District Line), June 15, 1905 (No. 649, in part).

Viola emarginata × **papilionacea** hyb. nov. Early leaves triangular, cucullate, cordate, glabrous, very small; flowers small, pale purplish-blue, about 1 cm. broad, with dark blue center and conspicuous purple veins; later leaves large, triangular, truncate or shallowly cordate, pale green, margins crenate-serrate toward the apex, deeply dentate or cut-toothed at the base, capsules about 6 mm. long or less on ascending peduncles, abortive, those from the petaliferous flowers apparently never developing.— Takoma Park, July 30, 1904 (No. 141), Aug. 25, 1904 (No. 334, type), Apr. 23, 1905 (No. 606), Oct. 4, 1905 (No. 1645).

VIOLA EMARGINATA × SAGITTATA Brainerd, RHODORA 8: 58. 1906.— North Takoma (Nos. 140, 142, 905); Hyattsville (Nos. 1638, 1647); Glen Carlyn, Va. (No. 1047).

Viola emarginata × **villosa** hyb. nov. Leaves with the general outline of *V. emarginata* but smaller, shallowly lobed or toothed at the base, pubescent above with the conspicuous whitish hairs of *V. villosa*. Growing with both of these species at Takoma Park, May 2, 1905 (No. 646, type).

VIOLA FIMBRIATULA × PAPILIONACEA Brainerd, RHODORA 8: 54. 1906. *V. fimbriatula aberrans* Stone, Proc. Phila. Acad. 1903: 683. pl. 37. f. 4–6. 1903.— Riverdale, Sept. 26, 1904 (No. 538), Sept. 25, 1905 (No. 1608); Darlecarlia Reservoir, June 17, 1905 (No. 1026, 1027).

VIOLA FIMBRIATULA × SAGITTATA Brainerd, RHODORA 8: 57. 1906.— The most abundant violet hybrid of this vicinity and occurring almost everywhere that the two species, *V. fimbriatula* and *V.*

sagittata are found near together. Extremely diverse in leaf-outline and many of the intermediate forms are highly fertile, producing normal capsules and potent seeds.

Viola fimbriatula × **villosa** *hyb. nov.* Leaves oblong-ovate, strongly but rather distantly crenate, cordate, obtuse, sparingly pubescent on the petioles and under surface of the leaf-blades, strongly pubescent above with rigid, whitish hairs peculiar to *V. villosa*, deep-green but faintly mottled with whitish by the darker green regions of the principal veins, the abortive capsules on spreading peduncles.—Takoma Park, Aug. 3, 1904 (No. 143a, type).

VIOLA PALMATA × **VILLOSA** Brainerd, *RHODORA* 8: 56. 1906.—Four-mile-run, Va., *Jos. H. Painter*, Aug. 5, 1904 (No. 865); *H. D. House*, Aug. 9, 1904 (No. 182); Darlecarlia Reservoir, May 23, 1905 (No. 804); Glen Echo, May 25, 1905 (No. 823); Rock Creek Park, May 13, 1905 (No. 712); Fairfax Co., Va., June 29, 1905 (No. 1079).

VIOLA PAPILIONACEA × **SAGITTATA** Brainerd, *RHODORA* 8: 54. 1906.—This was referred to by me as *V. conjugens* Greene, in a previous article on the violets of New Jersey (*Bull. Torrey Club* 32: 256. 1905), and a subsequent comparison of the New Jersey specimens with the type of *V. conjugens*, shows that they are the same. As *V. conjugens* was described from Anne Arundel Co., Md., it comes within the range of this paper.

Viola papilionacea × **villosa** *hyb. nov.* Mature leaf-blades oblong-ovate to suborbicular, obtuse, obscurely crenate toward the apex, more conspicuously serrate at the base, cordate, deep-green, nearly glabrous, especially beneath but the blades more or less pubescent above with whitish hairs, capsules abortive on spreading peduncles. Growing with the two species, *V. papilionacea* and *V. villosa* at Darlecarlia Reservoir, June 17, 1905 (No. 1029, type).

Viola Stoneana × **villosa** *hyb. nov.* Growing in dense, matted clumps, the leaves at flowering time spreading on petioles 5 to 10 cm. long, pubescent above with the silvery whitish hairs characteristic of *V. villosa* and even more strongly ciliate on the margins than *V. Stoneana*, nearly glabrous beneath and somewhat shining; size of plant and lobing of the mature leaf-blades exactly intermediate between the two species and growing with them. Flowers intermediate in color between the blue of *V. Stoneana* and the deep purple of *V. villosa*. (PLATE 72.)—Hyattsville, May 5, 1905 (No. 685, type), June 4, 1905 (No. 935a).

In addition to these forms which considerable field study of their habit and surroundings have shown to be unmistakably of hybrid origin and in which, for the most part, it has been easy to determine from what species they have been derived, there are many uncertain forms in need of further study. Among them may be noted what seems to be a triple hybrid between *Viola (fimbriatula × papilionacea)* and *Viola emarginata*, at Takoma Park, July 23, 1904 (No. 95).

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EXPLANATION OF PLATES.

PLATE 71. *Viola Brittoniana × emarginata* House. (Natural size.) *a.* Flowering plant. *b.* Mature leaf. *c.* Cleistogamous flowers. *d, e.* Capsules from cleistogamous flowers.

PLATE 72. *Viola Stoneana × villosa* House. (Natural size.) *a.* Flowering plant. *b.* Mature plant. *c.* Cleistogamous flower. *d.* Capsule from cleistogamous flower.

NOTES ON ALGAE,—VII.

F. S. COLLINS.

IN this number of the Notes are included records of various species, etc., new to our flora; also a few items of interest in regard to previously recorded species; unless otherwise indicated, all were collected by the writer.

PHORMIDIUM RETZII (Ag.) Gomont forma FASCICULATUM (Bréb.) Gomont, Monogr. des Oscill., p. 197. The typical *P. Retzii* is a widely distributed species, and is common in sluggish waters throughout New England, in the form of rather firm coatings, from one half to one cm. thick, on stones and other objects. When the current is rather brisk, these coatings sometimes fringe out into narrow strings, but the extreme form appears to be unusual. It was found by the writer in quite rapid water, in Lynnfield, Mass., June 11, 1905. There was a distinct stipe-like part, flattened, expanding above into a broader lamina, repeatedly dividing, and ending in innumerable long, slender,